

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An isolated nucleic acid molecule encoding a geranyl diphosphate synthase large subunit protein.
2. An isolated nucleic acid molecule of Claim 1 encoding an angiosperm geranyl diphosphate synthase large subunit protein.
3. An isolated nucleic acid molecule of Claim 1 encoding a gymnosperm geranyl diphosphate synthase large subunit protein.
4. An isolated nucleic acid molecule of Claim 1 encoding an essential oil plant geranyl diphosphate synthase large subunit protein.
5. An isolated nucleic acid molecule of Claim 1 encoding a Lamiaceae geranyl diphosphate synthase large subunit protein.
6. An isolated nucleic acid molecule of Claim 1 encoding a *Mentha* geranyl diphosphate synthase large subunit protein.
7. An isolated nucleic acid molecule of Claim 6 encoding a *Mentha piperita* geranyl diphosphate synthase large subunit protein.
8. An isolated nucleic acid molecule of Claim 7 comprising the nucleotide sequence set forth in SEQ ID NO:1.
9. An isolated nucleic acid molecule of Claim 1 encoding a geranyl diphosphate synthase large subunit protein comprising the amino acid sequence of SEQ ID NO:2.
10. An isolated, recombinant geranyl diphosphate synthase large subunit protein.
11. An isolated, recombinant, angiosperm geranyl diphosphate synthase large subunit protein of Claim 10.

12. An isolated, recombinant, gymnosperm geranyl diphosphate synthase large subunit protein of Claim 11.

13. An isolated, recombinant, essential oil plant geranyl diphosphate synthase large subunit protein of Claim 10.

14. An isolated, recombinant, Lamiaceae, geranyl diphosphate synthase large subunit protein of Claim 10.

15. An isolated, recombinant, *Mentha* geranyl diphosphate synthase large subunit protein of Claim 10.

16. An isolated, recombinant, *Mentha piperita* geranyl diphosphate synthase large subunit protein of Claim 10.

17. An isolated, recombinant, *Mentha piperita* geranyl diphosphate synthase large subunit protein consisting of the amino acid sequence set forth in SEQ ID NO:2.

18. An isolated, recombinant geranyl diphosphate synthase protein comprising an isolated, recombinant geranyl diphosphate synthase large subunit protein and an isolated, recombinant geranyl diphosphate synthase small subunit protein.

19. A replicable expression vector comprising a nucleic acid molecule of Claim 1.

20. A replicable expression vector of Claim 19 comprising a nucleic acid molecule encoding a Lamiaceae geranyl diphosphate synthase large subunit protein.

21. A replicable expression vector of Claim 19 comprising a nucleic acid molecule encoding a *Mentha* geranyl diphosphate synthase large subunit protein.

22. A host cell comprising a vector of Claim 19.

23. A host cell comprising a vector of Claim 20.

24. A host cell comprising a vector of Claim 21.

25. A method of imparting or enhancing the production of geranyl diphosphate synthase large subunit in a host cell comprising introducing into the host cell an expression vector comprising a nucleic acid molecule encoding a geranyl diphosphate synthase large subunit protein under conditions enabling expression of the large subunit protein in the host cell.

26. The method of Claim 25 wherein the host cell is a eukaryotic cell.

27. The method of Claim 26 wherein the host cell is a plant cell.

28. The method of Claim 26 wherein the host cell is an animal cell.

29. A method of imparting or enhancing the production of geranyl diphosphate synthase in a host cell comprising introducing into the host cell an expression vector comprising a nucleic acid molecule encoding a geranyl diphosphate synthase large subunit protein and a nucleic acid molecule encoding a geranyl diphosphate synthase small subunit protein under conditions enabling expression of the large and small subunit proteins in the host cell.

30. The method of Claim 29 wherein the host cell is a eukaryotic cell.

31. The method of Claim 30 wherein the host cell is a plant cell.

32. The method of Claim 31 wherein the host cell is an animal cell.

33. A method of imparting or enhancing the production of geranyl diphosphate synthase in a host cell comprising introducing into the host cell an isolated, recombinant geranyl diphosphate synthase large subunit protein.

34. A method of treating cancer in a mammalian host comprising introducing into a cancerous cell a geranyl diphosphate synthase large subunit protein, a geranyl diphosphate synthase small subunit protein and a monoterpene synthase protein, said monoterpene synthase protein being capable of converting geranyl diphosphate to a monoterpene having anti-cancer properties.

35. The method of Claim 34 wherein said geranyl diphosphate synthase small subunit protein is from an essential oil plant species, said geranyl diphosphate

synthase large subunit protein is from a plant species of the family Lamiaceae, and said monoterpene synthase is limonene synthase.

36. The method of Claim 34 wherein said geranyl diphosphate synthase small subunit protein and said geranyl diphosphate synthase large subunit protein are both from a plant species of the family Lamiaceae, and said monoterpene synthase is limonene synthase.

37. The method of Claim 34 wherein said geranyl diphosphate synthase small subunit protein and said geranyl diphosphate synthase large subunit protein are both from a *Mentha* species and said monoterpene synthase is limonene synthase.

38. A method of treating cancer in a mammalian host comprising introducing into a cancerous cell a nucleic acid sequence encoding a geranyl diphosphate synthase large subunit protein, a nucleic acid sequence encoding a geranyl diphosphate synthase small subunit protein, and a nucleotide sequence encoding a monoterpene synthase protein, under conditions that enable expression of said large subunit, small subunit and monoterpene synthase proteins, said monoterpene synthase protein being capable of converting geranyl diphosphate to a monoterpene having anticancer properties.

39. The method of Claim 38 wherein said geranyl diphosphate synthase small subunit protein and said geranyl diphosphate synthase large subunit protein are both from a plant species of the family Lamiaceae, and said monoterpene synthase is limonene synthase.

40. The method of Claim 38 wherein said geranyl diphosphate synthase small subunit protein and said geranyl diphosphate synthase large subunit protein are both from a *Mentha* species and said monoterpene synthase is limonene synthase.

41. An isolated nucleic acid molecule that is capable of hybridizing to a nucleic acid molecule consisting of the nucleic acid sequence set forth in SEQ ID NO:1, or to a nucleic acid molecule consisting of the antisense complement of the nucleic acid sequence set forth in SEQ ID NO:1, under stringent conditions.